

Claims 1-10 (Cancelled).

11. (Currently Amended) A ~~press-forming~~ device for press-forming at least one portion of a material according to at least one predetermined condition, comprising:

at least one arrangement of:

a material characteristic input arrangement configured to provide at least one first characteristic from material characteristics comprising a thickness of the at least one portion of the material, a yield strength of the at least one portion of the material, about 0.2% proof stress, a tensile strength of the at least one portion of the material, an elongation of the at least one portion of the material, n value of the at least one portion of the material, r value of the at least one portion of the material, a stress-strain relation equation for the at least one portion of the material, a hardness of the at least one portion of the material, temperature, a surface roughness of the at least one portion of the material, a friction coefficient of the at least one portion of the material or a lubricant film thickness of the at least one portion of the material, or

a material characteristic measurement arrangement configured to measure at least one second characteristic of the material characteristics before the at least one portion of the material is formed;

a state variable detector configured to measure a state variable comprising a metal mold distortion amount, or the state variable and at least one of state variables comprising a punch reaction, a metal mold temperature, a work piece deformation amount or a work piece temperature during the formation of the at least one portion of the material;

a processing condition computer arrangement configured to determine from a first moment to a second moment at least one particular processing condition from at least one of a forming speed of the at least one portion of the material, a blank holding force or a metal mold temperature as a function of at least two of the at least one first characteristic, the at least one second characteristic or the at least one of the state variables, wherein the determination is performed using (i) a first influence function matrix for indicating a relation between a material characteristic of the material and a correction amount of the at least one particular processing condition, and (ii) a second influence function matrix for indicating a relation between a the state variable and the correction amount of the at least one particular processing condition; and

a processing condition controller configured to:

(i) control the at least one processing condition from processing conditions comprising at least one of a punch movement speed, a die movement speed, a metal mold temperature or a blank holding force based on the at least one processing condition,

(ii) correct an initialization value C0(i) of the at least one processing condition using:

$$\text{C0(i) (after correction)} = \text{C0(i) (initialization value)} * (1 + \sum (T1(i,j) * (P(j)/P0(j) - 1)))$$

$$(i = 1-L, j = 1-M),$$

where T1(i,j) is an influence function matrix which indicates a relation between a deviation of the material characteristic of a material from a reference value thereof and an amount of correction of the at least one processing condition, where P(j) are material characteristic values, where P0(j) are reference values for respective material characteristics, where L is a number of processing condition set values, and where M is a number of the material characteristic values, and

(iii) correct the at least one processing condition using:

$$C(i) = C0(i) * (1 + \sum (T2(i,k) * (S(k)/S0(k) - 1))), \quad (i = 1-L, k = 1-N),$$

where C(i) (i = 1-L) are correction values for respective processing conditions, where T2(i,k) (i = 1-L, k = 1-N) is an influence function matrix which indicates a relation between a deviation of a measured state variable to a reference value and a correction amount of the at least one processing condition, where S(k) (k = 1-N) is the state variable, where S0(k) (k = 1-N) is a reference state variable, and where N is a number of the state variable.

12. (Previously Presented) The press-forming device according to claim 11, wherein the material characteristic input arrangement comprises at least one a manual input device, a bar code reader, an IC tag reader, a flexible disc or a photomagnetic disc reader.

13. (Currently Amended) A ~~press-forming~~ method for press-forming at least one section of a material according to at least one predetermined forming condition, comprising:

at least one of:

providing at least first one characteristic from material characteristics comprising a thickness of the at least one portion of the material, a yield strength of the at least one portion of the material, about 0.2% proof stress, a tensile strength of the at least one portion of the material, an elongation of the at least one portion of the material, n value of the at least one portion of the material, r value of the at least one portion of the material, a stress-strain relation equation for the at least one portion of the material, a hardness of the at least one portion

of the material, temperature, a surface roughness of the at least one portion of the material, a friction coefficient of the at least one portion of the material or a lubricant film thickness of the at least one portion of the material, or

measuring at least second characteristic of the material characteristics before the at least one portion of the material is form;

measuring a state variable comprising a metal mold distortion amount, or the state variable and at least one of state variables comprising a punch reaction, a metal mold temperature, a work piece deformation amount or a work piece temperature during the formation of the at least one portion of the material;

determining from a first moment to a second moment at least one particular processing condition from at least one of a forming speed of the at least one portion of the material, a blank holding force or a metal mold temperature as a function of at least two of the at least one first characteristic, the at least one second characteristic or the at least one of the state variables, wherein the determination is performed using (i) a first influence function matrix for indicating a relation between a material characteristic of the material and a correction amount of the at least one particular processing condition, and (ii) a second influence function matrix for indicating a relation between ~~a~~ the state variable and the correction amount of the at least one particular processing condition; and

controlling the at least one processing condition from processing conditions comprising at least one of a punch movement speed, a die movement speed, a metal mold temperature or a blank holding force based on the at least one processing condition;

correcting an initialization value C0(i) of the at least one processing condition using:

$$\begin{aligned} C0(i) \text{ (after correction)} &= C0(i) \text{ (initialization value)} * (1 + \sum (T1(i,j) * (P(j)/P0(j) - 1))) \\ &\quad (i = 1-L, j = 1-M), \end{aligned}$$

where T1(i,j) is an influence function matrix which indicates a relation between a deviation of the material characteristic of a material from a reference value thereof and an amount of correction of the at least one processing condition, where P(j) are material characteristic values, where P0(j) are reference values for respective material characteristics, where L is a number of processing condition set values, and where M is a number of the material characteristic values; and

correcting the at least one processing condition using:

$$C(i) = C0(i) * (1 + \sum (T2(i,k) * (S(k)/S0(k) - 1))), \quad (i = 1-L, k = 1-N),$$

where C(i) (i = 1-L) are correction values for respective processing conditions, where T2(i,k) (i = 1-L, k = 1-N) is an influence function matrix which indicates a relation between a deviation of a measured state variable to a reference value and a correction amount of the at least one processing condition, where S(k) (k = 1-N) is the state variable, where S0(k) (k = 1-N) is a reference state variable, and where N is a number of the state variable.

14. (Previously Presented) The press-forming method according to claim 13, wherein the at least first one characteristic is provided using at least one of a manual input procedure, a bar code read procedure, an IC tag read procedure, a flexible disc read procedure or a photomagnetic disc read procedure.

15. (Currently Amended) A press-forming method for press-forming at least one section of a material according to at least one predetermined forming condition, comprising:

measuring a state variable comprising a metal mold distortion amount, or the state variable and at least one variable from state variables which comprise a punch reaction, a metal mold temperature, a work piece deformation amount or a work piece temperature during a formation of the at least one section of the material, and storing one or more measured state variables for every formation of the at least one section of the material;

comparing at least one variable with at least one previously-measured or previously-obtained one of the state variable to generate a comparison result;

determining from a first moment to a second moment at least one processing condition from at least one type a forming speed, a blank holding force, or a metal mold temperature using the comparison result, wherein the determination is performed using an influence function matrix for indicating a relation between-a the state variable and a correction amount of the at least one processing condition;-and

controlling at least one processing condition of processing conditions which comprise a punch movement speed, a die movement speed, a metal mold temperature or a blank holding force based on the at least one processing condition; and

correcting the at least one processing condition using:

$$C(i) = C0(i) * (1 + \sum (T2(i,k) * (S(k)/S0(k) - 1))), \quad (i = 1-L, k = 1-N),$$

where C(i) (i = 1-L) are correction values for respective processing conditions, where

C0(i) is an initialization value, where T2(i,k) (i = 1-L, k = 1-N) is an influence function

matrix which indicates a relation between a deviation of a measured state variable to a

reference value and a correction amount of the at least one processing condition, where  
 $S(k)$  ( $k = 1-N$ ) is a state variable, where  $S0(k)$  ( $k = 1-N$ ) is a reference state variable,  
where  $L$  is a number of processing condition set values, and where  $N$  is a number of the  
state variable.

16. (Previously Presented) The press-forming method according to claim 15, further comprising:

providing at least one characteristic from material characteristics comprising a thickness of the at least one portion of the material, a yield strength of the at least one portion of the material, about 0.2% proof stress, a tensile strength of the at least one portion of the material, an elongation of the at least one portion of the material,  $n$  value of the at least one portion of the material,  $r$  value of the at least one portion of the material, a stress-strain relation equation for the at least one portion of the material, a hardness of the at least one portion of the material, temperature, a surface roughness of the at least one portion of the material, a friction coefficient of the at least one portion of the material or a lubricant film thickness of the at least one portion of the material,

wherein the at least one processing condition is determined from the at least one characteristic and the at least one variable for every formation of the at least one portion measured for the at least one variable.

17. (Previously Presented) The press-forming method according to claim 15, wherein the comparison result is obtained by comparing a difference between a past state variable and the at least one variable, a moving average value and a predetermined

value within at least one of a predetermined time period or a predetermined number of repetitions.

18. (Previously Presented) The press-forming method according to claim 16, wherein the comparison result is obtained by comparing a difference between a past state variable and the at least one variable, a moving average value and a predetermined value within at least one of a predetermined time period or a predetermined number of repetitions.

19. (Withdrawn) A software arrangement which is capable configuring a processing arrangement to perform a press-forming procedure according to at least one predetermined forming condition, comprising:

a first set of instruction which, when executed by a processing arrangement, causes at least one of:

provide at least first one characteristic from material characteristics comprising a thickness of the at least one portion of the material, a yield strength of the at least one portion of the material, about 0.2% proof stress, a tensile strength of the at least one portion of the material, an elongation of the at least one portion of the material, n value of the at least one portion of the material, r value of the at least one portion of the material, a stress-strain relation equation for the at least one portion of the material, a hardness of the at least one portion of the material, temperature, a surface roughness of the at least one portion of



the material, a friction coefficient of the at least one portion of the material or a lubricant film thickness of the at least one portion of the material, or

measuring at least second characteristic of the material characteristics before the at least one portion of the material is form;

a second set of instruction which, when executed by the processing arrangement, cause a measurement of at least one of state variables comprising a punch reaction, a metal mold temperature, a metal mold distortion amount, a work piece deformation amount or a work piece temperature during the formation of the at least one portion of the material;

a third set of instruction which, when executed by the processing arrangement, cause a determination of at least one particular processing condition from at least one of a forming speed of the at least one portion of the material, a blank holding force or a metal mold temperature as a function of at least two of the at least one first characteristic, the at least one second characteristic or the at least one of the state variables; and

a fourth set of instruction which, when executed by the processing arrangement, cause a control of the at least one processing condition from processing conditions comprising at least one of a punch movement speed, a die movement speed, a metal mold temperature or a blank holding force based on the at least one processing condition.

20. (Withdrawn) A computer accessible recording medium on which a program or software is provided, the program or software being accessible by a processing

arrangement to cause a performance of a press-forming procedure according to at least one predetermined forming condition, wherein the program or software comprising:

a first set of instruction which, when executed by the processing arrangement, causes at least one of:

provide at least first one characteristic from material characteristics comprising a thickness of the at least one portion of the material, a yield strength of the at least one portion of the material, about 0.2% proof stress, a tensile strength of the at least one portion of the material, an elongation of the at least one portion of the material, n value of the at least one portion of the material, r value of the at least one portion of the material, a stress-strain relation equation for the at least one portion of the material, a hardness of the at least one portion of the material, temperature, a surface roughness of the at least one portion of the material, a friction coefficient of the at least one portion of the material or a lubricant film thickness of the at least one portion of the material, or

measuring at least second characteristic of the material characteristics before the at least one portion of the material is form;

a second set of instruction which, when executed by the processing arrangement, cause a measurement of at least one of state variables comprising a punch reaction, a metal mold temperature, a metal mold distortion amount, a work piece deformation amount or a work piece temperature during the formation of the at least one portion of the material;

a third set of instruction which, when executed by the processing arrangement, cause a determination of at least one particular processing condition from at least one

of a forming speed of the at least one portion of the material, a blank holding force or a metal mold temperature as a function of at least two of the at least one first characteristic, the at least one second characteristic or the at least one of the state variables; and

a fourth set of instruction which, when executed by the processing arrangement, cause a control of the at least one processing condition from processing conditions comprising at least one of a punch movement speed, a die movement speed, a metal mold temperature or a blank holding force based on the at least one processing condition.

21. (New) The press-forming device according to claim 11, wherein the punch reaction is monitored using a load cell.

22. (New) The press-forming method according to claim 13, wherein the punch reaction is measured using a load cell.

23. (New) The press-forming method according to claim 15, wherein the punch reaction is measured using a load cell.